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US 6072504 A US 4144813 A

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(54) Abstract Title

Axial roller movement effecting sleeve expansion fluid port connection

(57) To mount or remove an exchangeable sleeve 7 of a cantilever printing machine roller 2 with an optional intermediate tubular element 3, the sleeve is expanded circumferentially by fluid pressure supplied through bores 4, 5 opening to the roller/element surface. The fluid is fed to the bores 4 through a port at one end of the roller, which port is sealable 10 against a fluid supply mouthpiece 14 on the machine frame 11 by axial displacement 15 of the roller using a transverse register adjustment means. Removes the need for manual application of pressure to the roller bores.

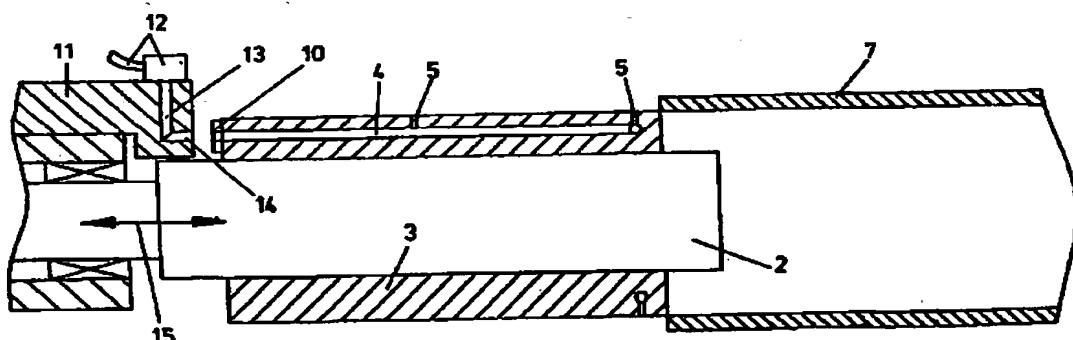


Figure 2

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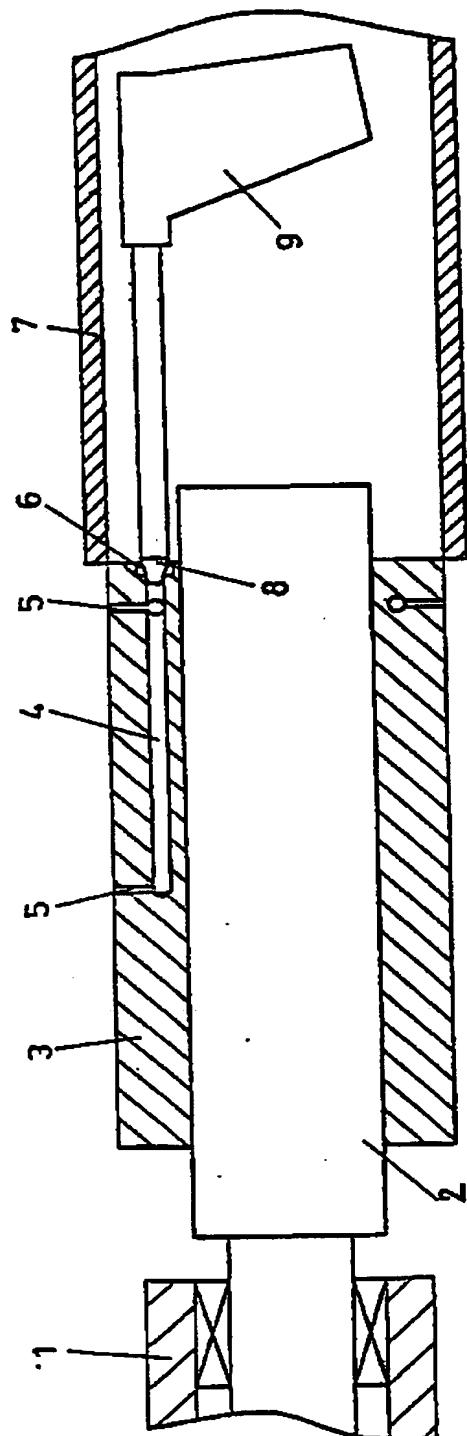


Figure 1

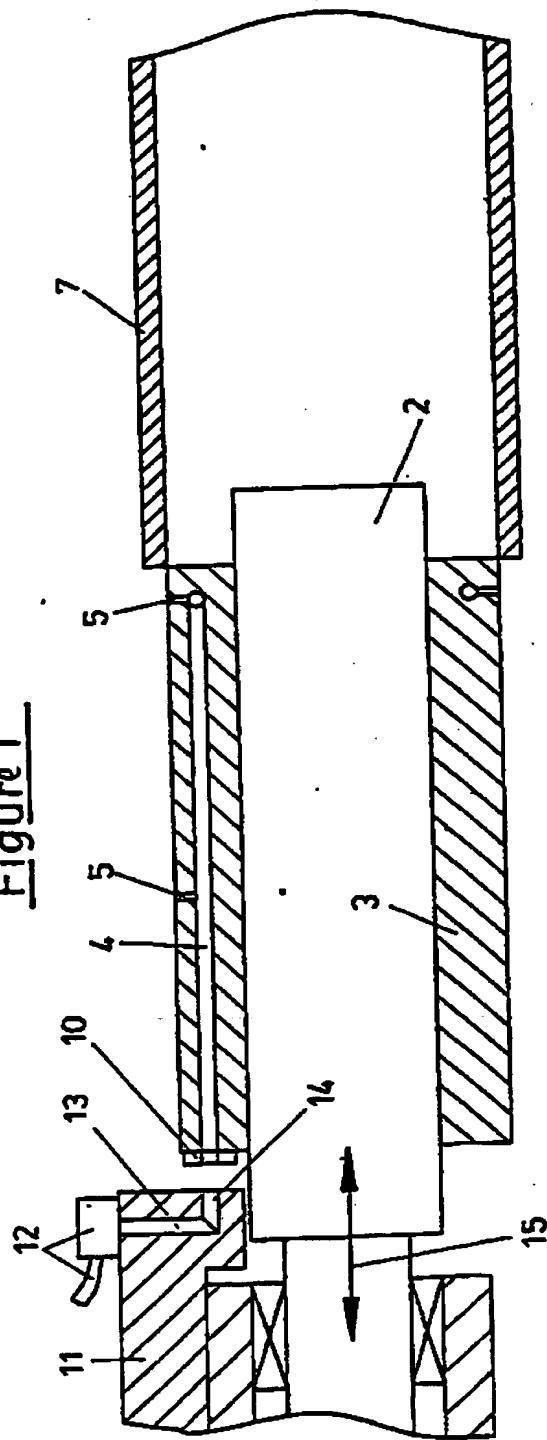


Figure 2

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Printing Machine

The invention relates to a printing machine having at least one roller with an exchangeable sleeve which, for the purpose of mounting and removal, can be

5 expanded in the circumferential direction by a liquid or a gas (fluid) fed through holes in the roller which open on the cylindrical surface or through holes in an intermediate tube which is fitted onto the roller, each having a port at the end, and having a device, preferably a transverse register adjustment means, which moves the roller relative to the machine frame in the axial direction.

10 In printers, as a function of different print jobs the sleeves which are provided with printing plates or blocks have to be replaced so that they can be re-equipped for new printing jobs. Furthermore, it may be necessary also to replace the sleeves of inking rollers or screen rollers. In order to exchange the sleeves it is necessary to provide auxiliary devices for expanding the sleeves in the

15 circumferential direction because the sleeves fit, with a frictionally locking press fit, on the roller or an intermediate tube.

A known device for mounting and removing sleeves fitted with blocks from a roller of a printer is explained with reference to Fig. 1 of the drawing:

A journal which forms a roller core 2 is mounted in cantilever fashion in the

20 machine frame 1 of a printer in the illustrated example. An intermediate tube 3, which is provided with at least one axially extending longitudinal bore 4 and transverse bores 5 which open on the surface of the intermediate tube 3, is secured to the journal 2. The or each longitudinal bore 4 is provided on the outer end side of the intermediate tube 3 with a port 6. In order to be able to mount onto the intermediate

25 tube 3 a sleeve 7 fitted, for example, with blocks, said sleeve 7 is pushed onto the intermediate tube 3 in the manner illustrated until said sleeve reaches the first transverse bores 5. Then the mouth nozzle 8 of a compressed air gun 9, by means of which compressed air is to be fed to the bores 4, 5, is fitted onto the port 6. The process of pushing the sleeve 7 on further is thus made easier by the compressed air

30 which is fed in because said air expands the sleeve 7 in the circumferential direction and simultaneously forms a cushion of compressed air, which reduces the friction, between the inner wall of the sleeve and the cylindrical surface of the intermediate

Correspondingly, compressed air is also fed to the bores 4, 5 via the port 6 when removing a sleeve 7 from the cylinder or from the intermediate tube 3.

Using a compressed air gun to feed compressed air to the bores of the roller, or of the intermediate tube fitted onto it, is complicated and requires the
5 operator of the machine to carry out procedures skilfully.

The object of the invention is therefore to provide a printer of the type mentioned in the opening paragraph above, in which a cushion of fluid can be generated between the sleeve and the surface of the roller or intermediate tube on which it is fitted, without complicated procedures which are executed by hand.

10 According to the invention there is provided a printing machine having at least one roller with an exchangeable sleeve which, for the purpose of mounting and removal, can be expanded in the circumferential direction by a fluid fed through bores in the roller which open on the cylindrical surface or through bores in an intermediate tubular element which is fitted onto the roller, each said bore having a
15 port at the end; and means for moving the roller relative to the machine frame in the axial direction; wherein a mouthpiece, aligned with said port, is provided in the machine frame for the fluid which is fed in under pressure, said mouthpiece being capable of being connected in a seal-forming fashion with the port by axial displacement of the roller.

20 In order to exchange the sleeve in the case of the printer according to the invention the roller or the intermediate tube on which it is fitted is moved axially towards the machine frame so that the port of the bores moves into seal-forming engagement with the mouthpiece which is both aligned with it and arranged in the machine frame. The axial movement of the roller is preferably carried out here by
25 means of the transverse register adjustment means, which is usually present in printers. Here, the transverse register adjustment means is adjusted in such a way that the port engages in a seal-forming fashion with the mouthpiece only in the end region of the transverse adjustment. The mouthpiece is connected by lines to a source of fluid or compressed air, a pressurized fluid being fed in through a
30 controlled connection only when the sleeve is to be replaced.

The invention can be applied to printers in which the rollers which are provided with exchangeable sleeves are mounted in cantilever fashion or in which one bearing of the rollers can be removed in such a way that, for the purpose of

removing the sleeves, said rollers remain mounted only at one end in the machine frame.

An exemplary embodiment of the invention is explained in more detail below with reference to Fig. 2 of the drawing.

- 5 A journal 2 which forms a roller core is mounted in cantilever fashion in the machine frame. An intermediate tubular element 3, which is provided with axially extending bores 4 and with transverse bores 5 which are connected thereto and which open on the surface of the intermediate tubular element 3, is permanently fitted onto this journal 2. The or each longitudinal bore 5 is provided at its end side
- 10 facing the machine frame with a port which is surrounded by a seal 10.

The machine frame (not illustrated) has a projecting bracket 11 which is provided with a port 12 for compressed air, said port opening into a bore 13 in the bracket 11. A horizontally extending bore section 14, which is radially aligned with the axial bore 4 or with its end port, adjoins the bore 13. The journal 2 can be

- 15 displaced in the direction of the double arrow 15 by means of a device (not illustrated) for transverse register adjustment.

- 20 If a sleeve 7, which is fitted with blocks for example, is to be mounted on or removed from the intermediate tube 3, the journal 2 is displaced in the direction of the machine frame by the transverse register adjustment means so that the port of the axial bore 4 engages in a seal-forming fashion with the bore section 14 of the machine frame. Once this seal-forming connection is produced, compressed air is fed to the bores 4, 5 via the bore sections 13, 14 and the port 12. Appropriate valve control means are provided for feeding in the compressed air.

- 25 Once the sleeve 7 has been replaced, the printing cylinder is moved into its printing position by the transverse register adjustment means.

In order to make it possible also to mount sleeves with different internal diameters, intermediate tubular elements 3 with different external diameters can be fitted onto the journal 2. It is therefore also possible for the intermediate tubular elements 3 to have the additional function of size adapters.

Claims

1. A printing machine having:
at least one roller with an exchangeable sleeve which, for the purpose of
5 mounting and removal, can be expanded in the circumferential direction by a fluid
fed through bores in the roller which open on the cylindrical surface or through bores
in an intermediate tubular element which is fitted onto the roller, each said bore
having a port at the end; and
means for moving the roller relative to the machine frame in the axial
10 direction;
wherein a mouthpiece, aligned with said port, is provided in the machine frame for
the fluid which is fed in under pressure, said mouthpiece being capable of being
connected in a seal-forming fashion with the port by axial displacement of the roller.
- 15 2. A printing machine according to claim 1 wherein said means for
moving the roller in the axial direction comprise a transverse register adjustment
means.
- 20 3. A printing machine constructed and arranged substantially as
hereinbefore described with reference to, and as illustrated in, Figure 2 of the
accompanying drawings.



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Application No: GB 9922197.0
Claims searched: 1-3

Examiner: J. C. Barnes-Paddock
Date of search: 7 March 2000

Patents Act 1977
Search Report under Section 17

Databases searched:

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:

UK Cl (Ed.R): F2U

Int Cl (Ed.7): B41F 13/10, 11, 12, 14, 16, 27/10, 30/02, 04; B41N 7/00; B65H 27/00;
D21G 1/02; F16C 13/00

Other: Online: WPI, EPODOC PAJ

Documents considered to be relevant:

| Category | Identity of document and relevant passage | Relevant to claims |
|----------|---|--------------------|
| A | US 5 072 504 (INTERNATIONAL COMPOSITES) See Figures 1, 3 and 4. External pressure fluid supply. | |
| A | US 4 144 813 (STRACHAN) See Figure 1 Roller with axial inlet. | |

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| X Document indicating lack of novelty or inventive step | A Document indicating technological background and/or state of the art. |
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